REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1-15 are pending in this application. Claims 1-4 and 12-15 stand rejected. Claims 5-11 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections – 35 U.S.C. §102

Claims 1-4 and 12-15 are rejected under 35 U.S.C. §102(a) as being anticipated by **Ohyama** (USP 4,541,029). For the reasons set forth in detail below, this rejection is respectfully traversed.

Ohyama discloses a device for protecting machinery from overload and light-load conditions. More particularly, **Ohyama** discloses a device that senses an electric current in one of the wires supplying electrical power to an electric motor to provide overload and light load detection (see, e.g., col. 1, lines 52-56).

A summary of the operation of the **Ohyama** system is disclosed in col. 1, line 57-col. 2, line 5. As discussed therein, current in an electric supply line of an induction motor is sensed by a current transformer to develop a voltage signal corresponding to the magnitude of current flowing through the electric supply line. The level of the voltage signal is compared to upper and lower reference voltage signals to determine an overload or light load condition, respectively. Further, in order to avoid spurious indications from transient conditions, a first timer is used to

assure that the detected overload or light-load condition exists for a minimum length of time. A second timer is provided to render the system ineffective during a known transient condition which exists when machinery is first started or is stopped.

Referring to Figs. 1 and 2, the relevant portions the **Ohyama** device will be discussed. More particularly, a current transformer 18 associated with an electrical supply line of an induction motor produces a current signal I that is transformed to a stable DC voltage by a transforming circuit 1. The voltage output by the transforming circuit 1 is compared with upper and lower reference voltage signals in upper and lower limit comparators 2, 3, respectively. The upper limit comparator 2 outputs a signal indicating an overload condition when the voltage output by the transforming circuit 1 is greater than an upper limit reference voltage. The lower limit comparator 3 outputs a signal indicating a light-load condition when the voltage output by the transforming circuit 1 is less than a lower limit reference voltage.

The **Ohyama** device further includes a DC power supply circuit 7 that powers a reference voltage setting circuit 8 for producing a reference voltage that is sent to a start-up/shut-down comparator 9. The start-up/shut-down comparator 9 compares the signal output by the transforming circuit 1 to the reference voltage set by the reference voltage setting circuit 8 to output a signal used to determine whether the motor is shutting down (see, e.g., col. 3, lines 46-48) or to starting up (see, e.g., col. 4, lines 3-21). In particular, the output of the start-up/shut-down comparator 9 is used in conjunction with timers 10 and 11 to render the system ineffective during transient conditions that exist when the machinery is first started or stopped.

It is noted that in Fig. 2, the DC power supply circuit 7 is supplied DC power from an AC/DC transformer 32. The primary winding of the transformer 32 is connected to an AC power source and the secondary winding is connected to the DC power supply circuit 7. See col. 5, lines 13-22.

The Office Action asserts that the transformer 32 corresponds to the claimed "transformer" and the transforming circuit 1 corresponds to the claimed "current-to-voltage conversion circuit".

Claims 1 and 3

The **Ohyama** device is very different from the invention recited in claims 1 and 3. First, **Ohyama** does not disclose or suggest "*starting a power supply to the transformer when an external voltage is applied to the output side of the current-to-voltage conversion circuit*" as recited in claim 1 (and similarly in claim 3).

Unlike the claimed invention, a power supply to the transformer 32 of **Ohyama** (considered by the Examiner to correspond to the claimed "transformer") is not started when an external voltage is applied to the output side of the transforming circuit 1 (considered by the Examiner to correspond to the claimed "current-to-voltage conversion circuit"). The Examiner cites element 8 of **Ohyama** to teach the external voltage applied to the output side of the current-to-voltage conversion circuit (see Office Action, Item 2). However, the element 8 is a reference voltage setting circuit that supplies a reference voltage to the start-up/shut-down comparator 9.

Further, the transformer 32 is apparently simply used to convert AC power to DC power that is supplied to the DC power supply circuit 7. The transformer 32 is not started when an external voltage is applied to the output side of the transforming circuit 1. In fact, **Ohyama** is completely silent regarding when and how the power supply (i.e., the AC power supply) to the transformer 32 is started or stopped.

Still further, **Ohyama** does not disclose or suggest "*stopping a power supply to the transformer when an output side of the current-to-voltage conversion circuit is in a no-load state or a light-load state*" (as recited in claim 1 (and similarly in claim 3). As noted above, **Ohyama** is completely silent regarding when and how the transformer 32 is started or stopped. **Ohyama** teaches interrupting power to an electric motor or sounding an alarm when an overload or light load state is detected (see col. 4, lines 25-28), but is silent regarding stopping a power supply to transformer 32 when a no-load or light-load state is detected.

In fact, if the power supply to the transformer 32 in ***Ohyama*** *were stopped in response to detecting a no-load or light-load state, then it would appear that the circuit in Figs. 1 and 2 would not operate properly because the reference voltage 8 would not be properly provided to the start-up/shut-down comparator.*

Moreover, **Ohyama** does not teach detecting when the output side of the transforming circuit 1 (considered by the Examiner to correspond to the claimed "current-to-voltage conversion circuit") is in a no-load or light-load state. **Ohyama** teaches detecting whether an ***induction motor*** operates in a overload or light load state, but does not teach determining whether the transforming circuit 1 ***itself*** is operating in a no-load or light load state. The

transforming circuit simply outputs a signal used to determine whether the ***induction motor*** is operating in an overload or light-load state.

Claims 14 and 15

Ohyama does not disclose or suggest "detecting a no-load state or a light-load state of an output side of the current-to-voltage conversion circuit"; "stopping a power supply to the transformer when the output side of the current-to-voltage conversion circuit is in the no-load state or the light-load state"; and "wherein the no-load state or light-load state is detected by detecting a state of the output side of the current-to-voltage conversion circuit", as recited in claim 14 (and similarly in claim 15).

First, as discussed above, **Ohyama** does not teach detecting when the output side of the transforming circuit 1 (considered by the Examiner to correspond to the claimed "current-to-voltage conversion circuit") is in a no-load or light-load state. Second, as discussed above, **Ohyama** is completely silent regarding when and how the power supply to the transformer 32 is started or stopped, and is silent regarding any relationship between stopping the power supply to the transformer 32 and the detecting the no-load or light-load state.

Claims 12 and 13

With respect to claim 12, **Ohyama** does not disclose or suggest the claimed "current-to-voltage conversion circuit assuming a deactivated state when the output side is in a no-load state or a light-load state and assuming an active state when an external voltage is applied to the

output side" and "said electronic apparatus comprising a switching circuit to apply the external voltage to the output side of the current-to-voltage conversion circuit in the deactivated state".

If the transforming circuit 1 (considered by the Examiner to correspond to the claimed "current-to-voltage conversion circuit") assumed a deactivated state when the output side [of the current-to-voltage conversion circuit] is in a no-load or light-load state, then the protection device of **Ohyama** would not operate. The transforming circuit 1 must be active for the device to operate.

Further, **Ohyama** does not disclose or suggest applying an external voltage to the output side of the transforming circuit 1. The transforming circuit 1 simply outputs a voltage value indicative of current. None of the circuits apply an external voltage to the ***output side*** of the transforming circuit.

With respect to claim 13, **Ohyama** does not disclose or suggest the claimed "first circuit to stop a power supply to the transformer and put the current-to-voltage conversion circuit into a deactivated state when the output section is in a no-load state or a light-load state" and "second circuit to start a power supply to the transformer and put the current-to-voltage conversion circuit into an active state when an external voltage is applied to the output section" and "a control section to apply the external voltage to the output section of the current-to-voltage conversion circuit in the deactivated state".

As noted above, first, the power supply to the transformer 32 of **Ohyama** is not stopped when the no-load or light-load is detected. Second, **Ohyama** does not disclose any relationship between starting a power supply to the transformer 32 and applying an external voltage to an

output section of the transforming circuit 1 (considered by the Examiner to correspond to the claimed "current-to-voltage conversion circuit"). Finally, **Ohyama** does not disclose or suggest any element that applies an external voltage to the output section of the transforming circuit 1.

Accordingly, it is respectfully submitted that independent claims 1, 3 and 12-15 patentably distinguish over **Ohyama** for at all of the above reasons. The dependent claims patetnably distinguish over the Ohyama reference by virtue of their dependency on the independent claims.

CONCLUSION

In view of the foregoing remarks, it is submitted that all pending claims are in condition for allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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